

Frequency of face touching with and without a mask in healthcare professionals

Tiffany Lucas¹, Rachel Mustain¹, and Robert Goldsby¹

¹University of California San Francisco

May 14, 2020

Abstract

The impact of wearing a mask on face-touching behavior is unknown. We conducted a brief survey and observational study to assess the perception and to quantify how masks affect face-touching behavior. Most felt that the mask would alter their face-touching behavior with only 18.3% feeling that masks would not affect it. During a total of 330 person-minutes of observation, overall face-touching rate was 15.1 face touches/hour (FT/hr), 6.4 FT/hr while wearing a mask and 20.1 FT/hr without a mask ($p < 0.01$). Masks are an effective barrier and reduce face-touching behavior amongst healthcare professionals.

Abbreviations	Definitions
CDC	Centers for Disease Control
COVID	corona virus disease
FT	face touches
hr	hour
US	United States

Introduction:

The current pandemic has led to numerous changes for all of us, including in pediatric hematology/oncology.¹ Emergency stay at home orders, social distancing and hygiene measures are all efforts to reduce transmission of this deadly virus. One of the last hygiene practices implemented was the recommendation to wear masks.

Prior to April 3rd, 2020 the mainline public health message in the US from the Centers for Disease Control (CDC) had been people do not need to wear masks unless they were sick. On February 29th, the US Surgeon General tweeted that masks “are NOT effective in preventing the general public from catching #coronavirus.” These recommendations were based on data available at the time and on concern for supply shortages. Additionally, some suggested that the general public did not know how to wear the masks properly and they may touch their face more in the process of wearing masks. On April 3rd, due to increasing concerns regarding asymptomatic and pre-symptomatic spread, the CDC recommended all people in public areas wear face coverings, encouraging the general public to use cloth coverings to reserve the surgical and N95 masks for hospital personnel. More recent data shows that masks are very important in reducing COVID transmission.²⁻⁴ Therefore, dispelling myths about risks of wearing face masks seems important.

We conducted a brief survey and observational study to assess healthcare providers’ impressions on the effect of donning a mask on face-touching behavior and to evaluate the impact of wearing a mask on face-touching behavior.

Methods:

A one question survey was sent to 187 on our healthcare provider email list using Qualtrics. This email group includes attendings, fellows, nurse practitioners, nurses, clinical research coordinators, pharmacists and administrators and includes a similar population as the observational group. The survey simply asked:

“When you are wearing a mask, do you feel like you touch your face:

- Less often than you do without a mask.
- Same frequency as you do without a mask
- More often than you do without a mask”

The responses were anonymous. They had 1 week to answer the survey, and 2 email reminders were sent over the week to complete the survey.

We also monitored healthcare providers, including nurses, social workers, residents, fellows, and attending physicians, participating in a joint clinical meeting seated in the conference room and in view of the observer. The room was monitored for at least 5 minutes and up to 15 minutes per observation session. If someone new entered the room they were included in the observations. The number of healthcare professionals in the room, as well as the number wearing a mask, was quantified. Some individuals either put on a mask or took off the mask during the observation time. The amount of time each person wore a mask was noted.

The person-minutes with and without a mask was quantified for each observation period and the total. A touch to the face was only recorded if the person’s hand touched the skin, including mask if worn, from chin to forehead between the ears. Touches due to eating or drinking were not included. Touches of the hair or neck were not included.

The mean face touches (FT) per hour was the sum of all face touches divided by the sum of all person-minutes with and without a mask multiplied by 60min/hr. Additionally, the FT and person-hours were calculated for each observation session. The FT/person-hour were used to generate a box-plot. T-test were used to compare the FT/person-hour observations for those with a mask vs those without a mask (Stata version 15).

Results:

A total of 131 (70%) healthcare providers responded to the anonymous survey which showed that most felt wearing a mask would change your number of face touches (Figure 1).

The total person-minutes of observation was 330: a total of 269 person-minutes with a mask and 161 person-minutes without a mask. There were a total of 40 healthcare professionals observed; 24 who were wearing masks most of the time and 16 who were not. There were 6 different observation sessions ranging from 20 person-minutes to 120 person-minutes. The total face touches were 83, with 29 face touches in healthcare professionals wearing a mask and 54 face touches in healthcare professionals not wearing a mask.

The mean FT/hr for the entire group was 15.1. The average FT/hr for healthcare providers wearing a mask was 6.4 (0-17.8) compared to 20.1 (8.3-23.6) for healthcare providers not wearing a mask (Figure 2).

Discussion:

One of the important measures to reduce transmission of respiratory viral infections like coronavirus is to avoid touching your face.⁵ Face-touching is a frequent, unconscious behavior. We found that even during a period when face touching was discouraged, it remains a problem, but that wearing a mask may reduce the frequency.

In this study, those wearing a mask touched their face an average of 6.4/hr compared to 20.1/hr in those without a mask. Combined the overall rate was 15.1/hr and is comparable with other studies. One study of medical students found the students touched their face an average of 23/hr.⁶ Another study of clinicians and staff touched their face an average of 19/2hr.⁷ In another study of volunteers who were videotaped and told

they were being monitored for surfaces they touched, they were found to touch their eyes, nose or mouth an average of 15.7/hr.⁸ All of these studies highlight the importance of frequent hand washing.

Spontaneous face touching tends to increase in stressful situations and may be a natural form of stress release.⁹ In addition to wearing a mask, there are a few other measures that may reduce this common and natural behavior. Just being aware of this habit may help reduce the frequency. Other barriers, such as using a Kleenex, may reduce direct contact with mucous membranes. One could speculate that wearing glasses might potentially reduce touching the eyes. Since these natural face touch gestures may have both psychological importance and non-verbal communication cues, but also may have infectious risks, it suggests more thorough investigations are warranted to assess measures to reduce face touching in the most beneficial way.

While there are significant limitations of this brief observational study, it does suggest that masks can be worn without increasing face-touching behavior like some have previously thought or suggested. The small numbers of individuals observed and the limited observation time may bias the results. It is possible the people not donning masks are individuals who unconsciously touch their face more frequently. Also, if additional time of observation were conducted the difference in average touches to face between those wearing and not wearing masks might be different. However, additional comparable data collection was not feasible after the hospital implemented a mandatory practice of wearing masks at all times while in the hospital. This study did not quantify the number of touches to eyes, nostrils or mouth separately. These mucous membrane areas are the highest risk zones for viral transmission. However, the physical barrier of the mask to the nose and mouth would be expected to reduce the opportunity to touch these mucous membrane surfaces. Thus, the masks even further reduce contact touches to the high-risk zones.

In conclusion, wearing a mask is an effective barrier, and we found it may reduce hand-to-face contact. Hand hygiene remains paramount.

References

1. Kotecha RS. Challenges posed by COVID-19 to children with cancer. *Lancet Oncol* . 2020;21(5):e235.
2. Cheng VC, Wong SC, Chuang VW, et al. The role of community-wide wearing of face mask for control of coronavirus disease 2019 (COVID-19) epidemic due to SARS-CoV-2. *J Infect* . 2020.
3. Eikenberry SE, Mancuso M, Iboi E, et al. To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic. *Infect Dis Model* . 2020;5:293-308.
4. Leung NHL, Chu DKW, Shiu EYC, et al. Respiratory virus shedding in exhaled breath and efficacy of face masks. *Nat Med* . 2020.
5. How to Protect Yourself & Others: Centers for Disease Control and Prevention; 2020.
<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html> (date accessed 5/13/20)
6. Kwok YL, Galton J, McLaws ML. Face touching: a frequent habit that has implications for hand hygiene. *Am J Infect Control* . 2015;43(2):112-114.
7. Elder NC, Sawyer W, Pallerla H, Khaja S, Blacker M. Hand hygiene and face touching in family medicine offices: a Cincinnati Area Research and Improvement Group (CARInG) network study. *J Am Board Fam Med* . 2014;27(3):339-346.
8. Nicas M, Best D. A study quantifying the hand-to-face contact rate and its potential application to predicting respiratory tract infection. *J Occup Environ Hyg* . 2008;5(6):347-352.
9. Grunwald M, Weiss T, Mueller S, Rall L. EEG changes caused by spontaneous facial self-touch may represent emotion regulating processes and working memory maintenance. *Brain Res* . 2014;1557:111-126.

Figure 1: There is a disparate distribution of responses to the survey. Most respondents feeling the masks would have some effect of the frequency of face-touching behavior.

Figure 2: Boxplot displaying the range of face touching rates in healthcare professionals wearing a mask (blue) and not wearing a mask (red): the minimum value (lower whisker), the first quartile (bottom of box), the median (line in box), the third quartile (top of box), and the maximum value (top whisker).

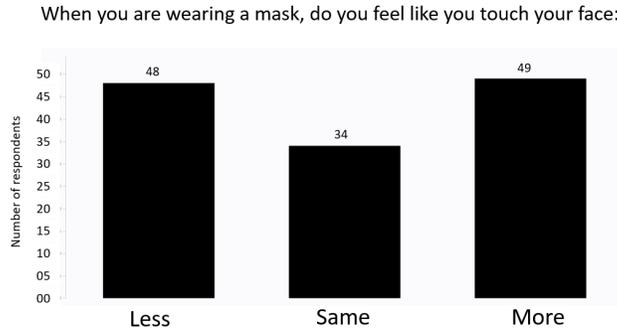


Figure 1: There is a disparate distribution of responses to the survey. Most respondents feeling the masks would have some effect of the frequency of face-touching behavior.

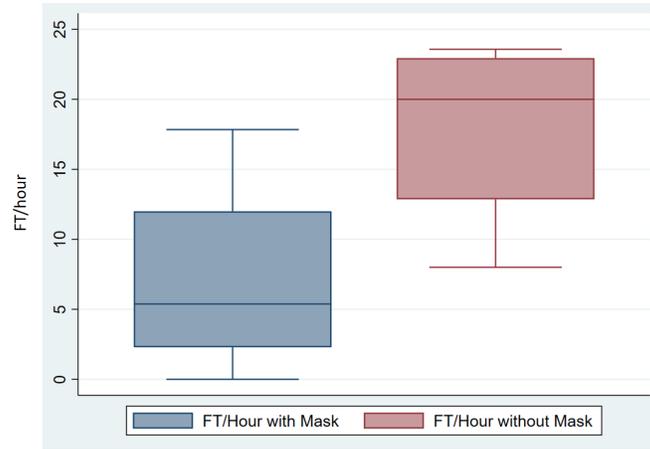


Figure 2: Boxplot displaying the range of face touching rates in healthcare professionals wearing a mask (blue) and not wearing a mask (red): the minimum value (lower whisker), the first quartile (bottom of box), the median (line in box), the third quartile (top of box), and the maximum value (top whisker).